Educational course: Neuroimaging – 4.11.2026 – 6.11.2026,

Location: CEITEC MU, Brno, Czech Republic,

Masaryk University Campus, Building E35, Seminar room 145

Detailed program

Wednesday 4th November

Time	Description
8:30-9:15	Registration of participants
9:15 – 9:25	**Introduction to the course** *(Michal Mikl)*
9:25 – 10:15	**Anatomical and physiological backgrounds to brain mapping** *(Pavel Hok)*
10:15 – 10:30	Coffee break
10:30 – 12:00	**Overview of MRI principles for non-physicists** *(Zenon Starčuk)*
12:00 – 13:00	Lunch
13:00 – 14:30	**fMRI basics** • **Principles of fMRI** *(Michal Mikl)* • **fMRI data preprocessing** *(Michal Mikl)* • **Statistical analysis of fMRI data** *(Martin Gajdoš)* • **Overview of fMRI connectivity** *(Martin Gajdoš)*
14:30 - 14:45	Coffee break
14:45 – 16:30	**Electrophysiological methods in brain mapping** • **EEG data preprocessing** *(Martin Kojan)* • **Data Analysis 1: ERPs, Time-Frequency Analysis** *(Martin Lamoš)* • **Data Analysis 2: EEG Microstates** *(Tomáš Jordánek)* • **Data Analysis 3: Electrical Source Imaging, Connectivity** *(Martin Lamoš)* •

Thursday 5th November

Time	Description
9:00 – 10:15	**Advanced fMRI and related topics** • **How to prepare acquisition of fMRI data** *(Michal Mikl)* • **Dynamical signatures of resting state activity** *(Jan Fousek)* • **Basics of human brain perfusion imaging with ASL** *(Martin Gajdoš)*
10:15 – 10:30	Coffee break
10:30 – 11:15	**Combination of fMRI with other modalities** *(Radek Mareček)*
11:15 – 12:00	**Diffusion MRI: Principles of DWI and fiber tracking** *(Petr Coufal / Lubomír Vojtíšek)*
12:00 – 13:00	Lunch
13:00 – 14:45	**Practical session in MRI labs** • Placed at MAFIL labs (2nd underground floor) • Two parallel groups: A) simultaneous EEG-fMRI recording, B) advanced fMRI approaches and fMRI accessories
14:45 – 15:00	Coffee break
15:00 – 16:00	**Morphometry** • **Principles and methods of brain morphometry** *(Radek Mareček)* • **Group analysis in morphometry and other advanced topics** *(Radek Mareček)*
16:00 – 16:30	**Data quality issues in MRI/fMRI** *(Michal Mikl)*

Friday 6th November

Time	Description
9:00 – 10:30	**Noninvasive brain stimulation techniques** • **Transcranial magnetic stimulation- basic principles and applications** *(Luboš Brabenec)* • **Transcranial electric stimulation- basic principles and novel methods of NIBS** *(Ľubomíra Nováková)*
10:30 – 10:45	Coffee break
10:45 – 11:30	**Differences between Animal and Human MRI Studies (Technical Aspects); Quantitative Perfusion Imaging (DCE-MRI)** (Ondřej Macíček)
11:30 – 12:15	**Neuroimaging studies and data – practical aspects** • **Data workflow and data formats in neuroimaging. FAIR data, preparation of publicly available datasets** *(Tomáš Slavíček)* • **How to prepare and conduct neuroimaging study – practical hints** *(Michal Mikl)*
12:15 – 13:15	Lunch
13:15 – 15:30	**fMRI data processing with SPM - practical session** Processing of fMRI data in SPM12 with example dataset (Michal Mikl / Kateřina Ingrová / Martin Gajdoš)